0059233

SAF-B00-030
100 F Area - Full Protocol
FINAL DATA PACKAGE

FAX RESULTS TO:

Mike Stankovich N/A
INITIAL/DATE

VERIFICATION OF CLIENT RECEIPT:

Phone or CC:Mail to Mike Stankovich N/A
INITIAL/DATE

COMPLETE COPY OF DATA PACKAGE TO:

Mike Stankovich X9-10 BL 2/6/03
INITIAL/DATE

Jeanette Duncan BF 2/6/03
INITIAL/DATE

COMMENTS: (PLEASE INCLUDE THE FOLLOWING ON THE FAX COVER SHEET)

SDG W03944 SAF-B00-030

Rad only Chem only X Rad & Chem

X Complete Partial

Waste Site: 116-F-1

RECEIVED
APR 2 8 2003
EDMC

Analytical Data Package Prepared For

Bechtel Hanford

Radiochemical Analysis By

STL Richland

2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.

Assigned Laboratory Code: STLRL

Data Package Contains 55 *Pages*

Report No.: 21671

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W03944	B00-030	J00FL0	J3A090301-1	FFVM61AC	9FFVM610	3010350
		J00FL0	J3A090301-1	FFVM62AF	9FFVM620	3010352
		J00FL0	J3A090301-1	FFVM61AD	9FFVM610	3010354
		J00FL0	J3A090301-1	FFVM61AG	9FFVM610	3010356
		J00FL0	J3A090301-1		9FFVM610	3010358

FEB 2003

SEVERN TRENT STL

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

January 31, 2003

Attention: Joan Kessner

SAF Number	:	B00-030
Date SDG Closed	:	January 9, 2003
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W03944
Data Deliverable	:	21-Day / Summary

I. Introduction

On January 9, 2003, one soil sample was received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

STLR ID#	BHI ID#	MATRIX	DATE OF RECEIPT
FFVM6	J00FL0	SOIL	1/9/03

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Gas Proportional Counting
Total Strontium by method RICH-RC-5006
Liquid Scintillation Counting
Carbon-14 by method RICH-RC-5022
Nickel-63 by method RICH-RC-5069
Gamma Spectroscopy
Gamma Spec by method RICH-RC-5017
Chemical Analyses
Chromium Hex by EPA method 7196A

III. Quality Control

The analytical results for each analysis performed under SDG W03944 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Gas Proportional Counting
Total Strontium by method RICH-RC-5006:
The LCS, batch blank, sample duplicate (J00FL0), and sample results are within contractual requirements.

Liquid Scintillation Counting
Carbon-14 by method RICH-RC-5022:
The LCS, batch blank, sample duplicate (J00FL0), and sample results are within contractual requirements.

Nickel-63 by method RICH-RC-5069:
The LCS, batch blank, matrix spike (J00FL0), sample duplicate (J00FL0), and sample results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RICH-RC-5017:
The LCS, batch blank, sample duplicate (J00FL0), and sample results are within contractual requirements.

Chemical Analyses
Chromium Hex by EPA method 7196A:
The LCS, batch blank, sample duplicate (J00FL0), matrix spike (J00FL0), color (J00FL0 PbCrO4) spike, and sample results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Barbara M. Gillespie
Project Manager

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/vn), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) u_c - ***Combined Uncertainty.***	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, u_c *the combined uncertainty*. The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the **Work Order** Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2$ + $TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

STL Richland STLRL

Ordered by Client Sample ID, Batch No.

Date: 03-Feb-03

Report No. : 21671

SDG No: W03944

Client ID	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC|MDA	RER
J00FL0	FFVM61AC	STRONTIUM	-1.64E-02 +- 5.9E-02	U	pCi/g	75.90%	1.46E-01	
J00FL0	FFVM62AF	CO-60	-2.35E-03 +- 1.3E-02	U	pCi/g		2.14E-02	
		CS-137	6.85E-02 +- 2.1E-02		pCi/g		2.26E-02	
		EU-152	1.95E-01 +- 6.9E-02	U	pCi/g		6.55E-02	
		EU-154	7.06E-03 +- 3.9E-02	U	pCi/g		6.80E-02	
		EU-155	6.08E-02 +- 3.5E-02	U	pCi/g		5.92E-02	
J00FL0	FFVM61AD	NI-63	2.58E+00 +- 5.0E+00	U	pCi/g	87.57%	6.16E+00	
J00FL0	FFVM61AG	C-14	-2.51E-01 +- 3.6E-01	U	pCi/g	100.00%	8.07E-01	
J00FL0	9FFVM610	HEXCHROME	-2.59E-02 +- 0.0E+00	U	mg/kg	N/A	8.00E-02	
J00FL0 DUP	FFVM61AH	STRONTIUM	2.06E-02 +- 6.6E-02	U	pCi/g	76.60%	1.52E-01	0.8
J00FL0 DUP	FFVM62AJ	CO-60	2.20E-02 +- 1.4E-02	U	pCi/g		2.65E-02	2.6
		CS-137	9.07E-02 +- 2.6E-02		pCi/g		2.44E-02	1.3
		EU-152	1.21E-01 +- 5.2E-02	U	pCi/g		7.27E-02	1.7
		EU-154	-5.06E-03 +- 4.8E-02	U	pCi/g		8.08E-02	0.4
		EU-155	7.03E-02 +- 4.1E-02	U	pCi/g		6.95E-02	0.4
J00FL0 DUP	FFVM61AL	NI-63	3.85E+00 +- 5.2E+00	U	pCi/g	86.66%	6.65E+00	0.4
J00FL0 DUP	FFVM61AM	C-14	-2.30E-01 +- 3.6E-01	U	pCi/g	100.00%	8.07E-01	0.1
J00FL0 DUP	FFVM61AR	HEXCHROME	0.00E+00 +- 0.0E+00	U	mg/kg	N/A	8.00E-02	

Number of Results: 18

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

QC Results Summary
STL Richland STLRL

Ordered by QC Type, Batch No.

Date: 03-Feb-03

Report No. : 21671

SDG No.: W03944

QC Type	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC|MDA
BLANK QC	FFXGH1AA	STRONTIUM	-3.72E-03 +- 5.6E-02	U	pCi/g	86.10%			1.35E-01
BLANK QC	FFXHW1AA	CO-60	-1.14E-03 +- 7.6E-03	U	pCi/g				1.32E-02
		CS-137	-2.81E-03 +- 8.4E-03	U	pCi/g				1.41E-02
		EU-152	8.29E-03 +- 2.4E-02	U	pCi/g				3.87E-02
		EU-154	-1.76E-02 +- 2.2E-02	U	pCi/g				3.56E-02
		EU-155	9.64E-03 +- 2.8E-02	U	pCi/g				4.73E-02
BLANK QC	FFXH31AA	NI-63	-2.65E-01 +- 5.8E+00	U	pCi/g	74.78%			7.60E+00
BLANK QC	FFXH71AA	C-14	1.30E-02 +- 1.5E-01	U	pCi/g	100.00%			3.34E-01
LCS	FFXGH1AC	STRONTIUM	1.07E+00 +- 3.1E-01		pCi/g	83.60%	93.83%	-0.1	1.39E-01
LCS	FFXHW1AC	CS-137	3.44E-01 +- 5.9E-02		pCi/g		119.48%	0.2	3.63E-02
		K-40	2.08E+01 +- 2.7E+00		pCi/g		106.51%	0.1	3.08E-01
		RA-226	1.00E+00 +- 1.6E-01		pCi/g		98.46%	0.0	6.17E-02
		RA-228	2.17E+00 +- 3.2E-01	U	pCi/g		115.74%	0.2	3.00E-01
		U-238DHP	1.38E+00 +- 1.0E+00		pCi/g		131.29%	0.3	1.02E+00
LCS	FFXH31AC	NI-63	5.28E+02 +- 4.7E+01		pCi/g	82.32%	104.46%	0.0	6.57E+00
LCS	FFXH71AC	C-14	7.08E+00 +- 3.9E-01		pCi/g	100.00%	97.12%	0.0	3.34E-01
MATRIX SPI	FFVM61AK	NI-63	5.04E+02 +- 4.5E+01		pCi/g	88.79%	100.14%	0.0	6.12E+00
MATRIX SPI	FFVM61AW	HEXCHROME	3.92E+01 +- 0.0E+00		mg/kg	N/A	84.18%	-0.2	8.00E-02
LCS	FFXJH1AS	HEXCHROME	3.87E+01 +- 0.0E+00		mg/kg	N/A	96.70%	0.0	8.00E-02
BLANK QC	FFXJH1AB	HEXCHROME	6.77E-02 +- 0.0E+00	U	mg/kg	N/A			8.00E-02

Number of Results: 20

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 03-Feb-03

Lab Name: STL Richland | **SDG:** W03944 | **Collection Date:** 1/8/2003 8:45:00 AM

Lot-Sample No.: J3A090301-1 | **Report No. :** 21671 | **Received Date:** 1/9/2003 2:00:00 PM

Client Sample ID: J00FL0 | **COC No. :** B00-030-086 | **Matrix:** SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 3010350	**Work Order:** FFVM61AC			**Report DB ID:** 9FFVM610								
STRONTIUM	-1.64E-02	U	5.9E-02	5.9E-02	1.46E-01	pCi/g	75.90%	*-0.11*	1/16/03 07:56 p		6.02	SRTOT_SEP_PRECIP
						6.76E-02		*-0.56*			G	GPC31A
Batch: 3010352	**Work Order:** FFVM62AF			**Report DB ID:** 9FFVM620								
CO-60	-2.35E-03	U	1.3E-02	1.3E-02	2.14E-02	pCi/g		*-0.11*	1/28/03 07:51 a		317.6	GAMMA_GS
							5.00E-02	*-0.38*			g	GER8$1
CS-137	6.85E-02		2.1E-02	2.1E-02	2.26E-02	pCi/g		*(3.)*	1/28/03 07:51 a		317.6	GAMMA_GS
							1.00E-01	*(6.4)*			g	GER8$1
EU-152	1.95E-01	U	6.9E-02	6.9E-02	6.55E-02	pCi/g		*(3.)*	1/28/03 07:51 a		317.6	GAMMA_GS
							1.00E-01	*(5.7)*			g	GER8$1
EU-154	7.06E-03	U	3.9E-02	3.9E-02	6.80E-02	pCi/g		*0.1*	1/28/03 07:51 a		317.6	GAMMA_GS
							1.00E-01	*0.36*			g	GER8$1
EU-155	6.08E-02	U	3.5E-02	3.5E-02	5.92E-02	pCi/g		*(1.)*	1/28/03 07:51 a		317.6	GAMMA_GS
							1.00E-01	*(3.4)*			g	GER8$1
Batch: 3010354	**Work Order:** FFVM61AD			**Report DB ID:** 9FFVM610								
NI-63	2.58E+00	U	2.6E+00	5.0E+00	6.16E+00	pCi/g	87.57%	*0.42*	1/18/03 02:36 a		0.2514	NI63LSC
						3.00E+00	3.00E+01	*(1.)*			G	LSC4
Batch: 3010356	**Work Order:** FFVM61AG			**Report DB ID:** 9FFVM610								
C-14	-2.51E-01	U	3.2E-01	3.6E-01	8.07E-01	pCi/g	100.00%	*-0.31*	1/14/03 03:06 a		2.071	C14_LSC
						3.88E-01	5.00E+01	*-(1.4)*			G	LSC6
Batch: 3010358	**Work Order:**			**Report DB ID:** 9FFVM610								

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 03-Feb-03

Lab Name: STL Richland | **SDG:** W03944 | **Collection Date:** 1/8/2003 8:45:00 AM

Lot-Sample No.: J3A090301-1 | **Report No. :** 21671 | **Received Date:** 1/9/2003 2:00:00 PM

Client Sample ID: J00FL0 | **COC No. :** B00-030-086 | **Matrix:** SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
HEXCHROME	-2.59E-02	U		0.0E+00	8.00E-02	mg/kg	N/A	*-0.32*	1/22/03		2.5	EPA7196
								N/A			G	

Number of Results: 9

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 03-Feb-03

DUPLICATE RESULTS

Lab Name: STL Richland | **SDG:** W03944 | **Collection Date:** 1/8/2003 8:45:00 AM

Lot-Sample No.: J3A090301-1 | **Report No. :** 21671 | **Received Date:** 1/9/2003 2:00:00 PM

Client Sample ID: J00FL0 DUP | **COC No. :** B00-030-086 | **Matrix:** SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 3010350	**Work Order:** FFVM61AH			**Report DB ID:** FFVM61HR		**Orig Sa DB ID:** 9FFVM610						
STRONTIUM	2.06E-02	U	6.6E-02	6.6E-02	1.52E-01	pCi/g	76.60%	0.14	1/16/03 07:56 p		6.01	SRTOT_SEP_PRECIP
	-1.64E-02	U RER	0.8					0.62			G	GPC31B
Batch: 3010352	**Work Order:** FFVM62AJ			**Report DB ID:** FFVM62JR		**Orig Sa DB ID:** 9FFVM620						
CO-60	2.20E-02	U	1.4E-02	1.4E-02	2.65E-02	pCi/g		0.83	1/28/03 06:09 p		317.6	GAMMA_GS
	-2.35E-03	U RER	2.6			5.00E-02		(3.1)			g	GER7$1
CS-137	9.07E-02		2.6E-02	2.6E-02	2.44E-02	pCi/g		(3.7)	1/28/03 06:09 p		317.6	GAMMA_GS
	6.85E-02	RER	1.3			1.00E-01		(7.1)			g	GER7$1
EU-152	1.21E-01	U	5.2E-02	5.2E-02	7.27E-02	pCi/g		(1.7)	1/28/03 06:09 p		317.6	GAMMA_GS
	1.95E-01	U RER	1.7			1.00E-01		(4.7)			g	GER7$1
EU-154	-5.06E-03	U	4.8E-02	4.8E-02	8.08E-02	pCi/g		-0.06	1/28/03 06:09 p		317.6	GAMMA_GS
	7.06E-03	U RER	0.4			1.00E-01		-0.21			g	GER7$1
EU-155	7.03E-02	U	4.1E-02	4.1E-02	6.95E-02	pCi/g		(1.)	1/28/03 06:09 p		317.6	GAMMA_GS
	6.08E-02	U RER	0.4			1.00E-01		(3.4)			g	GER7$1
Batch: 3010354	**Work Order:** FFVM61AL			**Report DB ID:** FFVM61LR		**Orig Sa DB ID:** 9FFVM610						
NI-63	3.85E+00	U	2.8E+00	5.2E+00	6.65E+00	pCi/g	86.66%	0.58	1/18/03 05:59 a		0.2513	NI63LSC
	2.58E+00	U RER	0.4			3.00E+01		(1.5)			G	LSC4
Batch: 3010356	**Work Order:** FFVM61AM			**Report DB ID:** FFVM61MR		**Orig Sa DB ID:** 9FFVM610						
C-14	-2.30E-01	U	3.3E-01	3.6E-01	8.07E-01	pCi/g	100.00%	-0.29	1/14/03 03:48 a		2.07	C14_LSC
	-2.51E-01	U RER	0.1			5.00E+01		-(1.3)			G	LSC6
Batch: 3010358	**Work Order:**			**Report DB ID:** FFVM61AR		**Orig Sa DB ID:** 9FFVM610						
HEXCHROME	0.00E+00	U		0.0E+00	8.00E-02	mg/kg	N/A	0.	1/22/03		2.5	EPA7196
	-2.59E-02	U RPD	-2.0					N/A			G	

STL Richland
rptSTLRchDupV3.97 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 03-Feb-03

DUPLICATE RESULTS

Lab Name:	STL Richland	**SDG:**	W03944	**Collection Date:**	1/8/2003 8:45:00 AM
Lot-Sample No.:	J3A090301-1	**Report No. :**	21671	**Received Date:**	1/9/2003 2:00:00 PM
Client Sample ID:	J00FL0 DUP	**COC No. :**	B00-030-086	**Matrix:**	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector

Number of Results: 9

Comments:

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM II

Date: 03-Feb-03

BLANK RESULTS

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A090301- **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 3010358	Work Order:			Report DB ID: FFXJH1AB								
HEXCHROME	6.77E-02	U		0.0E+00	8.00E-02	mg/kg	N/A	0.85 N/A	1/22/03		2.5 G	EPA7196

Number of Results: 1

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 03-Feb-03

BLANK RESULTS

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A100000-350 **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 3010350	Work Order: FFXGH1AA			Report DB ID: FFXGH1AB								
STRONTIUM	-3.72E-03	U	5.6E-02	5.6E-02	1.35E-01	pCi/g	86.10%	-0.03	1/16/03 07:56 p		6.0	SRTOT_SEP_PRECIP
					6.23E-02			-0.13			G	GPC31C

Number of Results: 1

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 03-Feb-03

BLANK RESULTS

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A100000-352 **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 3010352	Work Order: FFXHW1AA			Report DB ID: FFXHW1AX								
CO-60	-1.14E-03	U	7.6E-03	7.6E-03	1.32E-02	pCi/g		-0.09	1/16/03 04:48 p		348.0	GAMMA_GS
						5.00E-02		-0.3			g	GER2$1
CS-137	-2.81E-03	U	8.4E-03	8.4E-03	1.41E-02	pCi/g		-0.2	1/16/03 04:48 p		348.0	GAMMA_GS
						1.00E-01		-0.67			g	GER2$1
EU-152	8.29E-03	U	2.4E-02	2.4E-02	3.87E-02	pCi/g		0.21	1/16/03 04:48 p		348.0	GAMMA_GS
						1.00E-01		0.69			g	GER2$1
EU-154	-1.76E-02	U	2.2E-02	2.2E-02	3.56E-02	pCi/g		-0.49	1/16/03 04:48 p		348.0	GAMMA_GS
						1.00E-01		-(1.6)			g	GER2$1
EU-155	9.64E-03	U	2.8E-02	2.8E-02	4.73E-02	pCi/g		0.2	1/16/03 04:48 p		348.0	GAMMA_GS
						1.00E-01		0.7			g	GER2$1

Number of Results: 5

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 03-Feb-03

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A100000-354 **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 3010354	Work Order: FFXH31AA			Report DB ID: FFXH31AB								
NI-63	-2.65E-01	U	3.1E+00	5.8E+00	7.60E+00	pCi/g	74.78%	-0.03	1/18/03 07:41 a		0.25	NI63LSC
					3.70E+00	3.00E+01		-0.09			G	LSC4

Number of Results: 1

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 03-Feb-03

BLANK RESULTS

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A100000-356 **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 3010356	Work Order: FFXH71AA			Report DB ID: FFXH71AB								
C-14	1.30E-02	U	1.4E-01	1.5E-01	3.34E-01	pCi/g	100.00%	0.04	1/14/03 01:42 a		5.0	C14_LSC
					1.61E-01	5.00E+01		0.17			G	LSC6

Number of Results: 1

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 03-Feb-03

LCS RESULTS

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A090301- **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 3010358	Work Order:			Report DB ID: FFXJH1AS									
HEXCHROME	3.87E+01			0.0E+00	8.00E-02	mg/kg	N/A	4.00E+01		96.70%	1/22/03	2.5	EPA7196
							Rec Limits:			0.0		G	

Number of Results: 1

Comments:

FORM II

Date: 03-Feb-03

LCS RESULTS

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A100000-350 **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 3010350	Work Order: FFXGH1AC			Report DB ID: FFXGH1CS									
STRONTIUM	1.07E+00		1.4E-01	3.1E-01	1.39E-01	pCi/g	83.60%	1.14E+00	2.2E-02	93.83%	1/16/03 07:56 p	6.0	SRTOT_SEP_PRECIP
							Rec Limits:	70.	130.	-0.1		G	GPC31D

Number of Results: 1

Comments:

FORM II

Date: 03-Feb-03

LCS RESULTS

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A100000-352 **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 3010352	Work Order: FFXHW1AC		Report DB ID: FFXHW1CM										
CS-137	3.44E-01		5.9E-02	5.9E-02	3.63E-02	pCi/g		2.88E-01	1.3E-02	119.48%	1/17/03 07:23 a	200.01	GAMMA_GS
							Rec Limits:	70.	130.	0.2		g	GER7$1
K-40	2.08E+01		2.7E+00	2.7E+00	3.08E-01	pCi/g		1.95E+01	1.9E+00	106.51%	1/17/03 07:23 a	200.01	GAMMA_GS
							Rec Limits:	70.	130.	0.1		g	GER7$1
RA-226	1.00E+00		1.6E-01	1.6E-01	6.17E-02	pCi/g		1.02E+00	5.2E-02	98.46%	1/17/03 07:23 a	200.01	GAMMA_GS
							Rec Limits:	70.	130.	0.0		g	GER7$1
RA-228	2.17E+00	U	3.2E-01	3.2E-01	3.00E-01	pCi/g		1.87E+00	9.6E-02	115.74%	1/17/03 07:23 a	200.01	GAMMA_GS
							Rec Limits:	70.	130.	0.2		g	GER7$1
U-238DHP	1.38E+00		1.0E+00	1.0E+00	1.02E+00	pCi/g		1.05E+00	5.4E-02	131.29%	1/17/03 07:23 a	200.01	GAMMA_GS
							Rec Limits:			0.3		g	GER7$1

Number of Results: 5

Comments:

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 03-Feb-03

LCS RESULTS

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A100000-354 **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 3010354	**Work Order:** FFXH31AC			**Report DB ID:** FFXH31CS									
NI-63	5.28E+02		9.1E+00	4.7E+01	6.57E+00	pCi/g	82.32%	5.05E+02	1.7E+01	104.46%	1/18/03 09:23 a	0.25	NI63LSC
							Rec Limits:	70.	130.	0.0		G	LSC4

Number of Results: 1

Comments:

FORM II

Date: 03-Feb-03

LCS RESULTS

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A100000-356 **Report No. :** 21671 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 3010356	Work Order: FFXH71AC		Report DB ID: FFXH71CS										
C-14	7.08E+00		3.0E-01	3.9E-01	3.34E-01	pCi/g	100.00%	7.29E+00	2.4E-01	97.12%	1/14/03 02:24 a	5.0	C14_LSC
							Rec Limits:	70.	130.	0.0		G	LSC6

Number of Results: 1

Comments:

FORM II

MATRIX SPIKE RESULTS

Date: 03-Feb-03

Lab Name: STL Richland **SDG:** W03944

Lot-Sample No.: J3A090301-1 **Report No. :** 21671 **Matrix:** SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2s)	Total Uncert(2s)	MDC|MDA	Rpt Unit, CRDL	Yield	Rec-overy	Exp-ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 3010354	**Work Order:** FFVM61AK			**Report DB ID:** FFVM61KW			**Orig Sa DB ID:** 9FFVM610						
NI-63	5.04E+02		8.6E+00	4.5E+01	6.12E+00	pCi/g	88.79%	100.14%	5.03E+02	1.7E+01	1/18/03 04:18 a	0.2513	NI63LSC
	2.58E+00	RER	22.1									G	LSC4
Batch: 3010358	**Work Order:**			**Report DB ID:** FFVM61AW			**Orig Sa DB ID:** 9FFVM610						
HEXCHROME	3.92E+01			0.0E+00	8.00E-02	mg/kg	N/A	84.18%	4.66E+01		1/22/03	2.5	EPA7196
	-2.59E-02	RPD	2.0									G	

Number of Results: 2

Comments:

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J3A090301
Client ID: BHI
Due Date: 1-30-03
QC Batch Number: 3010352
Method Test Parameter: Gamma
Matrix: Soil
SDG Number: W03944

Review Item	Yes (√)	No (√)	N/A (√)
A. COC 1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓	✓	
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?			✓
C. QC & Samples 1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓	✓	
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data 1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?			✓
4. Were spectra reviewed/meet contractual requirements?	✓		
5. Were raw counts reviewed for anomalies?			✓
E. Other 1. Are all Nonconformances included and noted? J07171	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response: _____

First Level Review: _____ Date: 1-29-03

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SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 301035Z

Review Item	Yes (√)	No (√)	N/A (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Nonconformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: _____

Second Level Review: _____ Date: 1/29/03

Clouseau
Nonconformance Memo

SEVERN TRENT SERVICES

NCM #:	J07171	Classification:	**Anomaly**
NCM Initiated By:	Dale OConnell	Status:	**PMREVIEW**
Date Opened:	01/29/03	Production Area:	Environmental - Prep
Date Closed:	N/A	Tests:	Gamma by GER
		Lot #'s (Sample #'s):	J3A090301 (1); J3A100000 (352)
		QC Batch:	3010352
Nonconformance:	Batch Result Out of Limits		
Subcategory:	Duplicate agreement exceeds acceptance limit		

Problem Description / Root Cause

Name	Date	Description
Dale OConnell	01/29/03	Cause unknown.
		Insufficient sample to generate a duplicate.
		Client requested U-238DHP at lower abundance, therefor erratic recoveries and higher MDA.

Corrective Action

Name	Date	Corrective Action
Dale OConnell	01/29/03	Recount sample and duplicate, precision within limits.
		Precision determination achieved by recounting sample on a different detector.
		Report results.

Approval History

Name	Date Approved:	Position
Dale OConnell	01/29/03	Group Leader

P

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J3A090301
Client ID: BHI
Due Date: 1/30/2003
QC Batch Number: 3010350
Method Test Parameter: TH TOTAL STRONTIUM
Matrix: SOIL
SDG Number: NA W03944

Review Item	Yes (√)	No (√)	N/A (√)
A. COC 1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	/		
B. QC Batch 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	/		
2. Are the QC appropriate for the analysis included in the batch?	/		
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	/		
4. Does the Worksheets include a Tracer Vial label for each sample?	/		
C. QC & Samples 1. Is the blank result, yield and MDA within contract limits?	/		
2. Is the LCS result, yield and MDA within contract limits?	/		
3. Are the MS/MSD results, yields and MDAs within contract limits?			/
4. Are the duplicate results, yields and MDAs within contract limits?	/		
5. Are the sample yields and MDAs within contract limits?	/		
D. Raw Data 1. Were results calculated in the correct units?	/		
2. Were analysis volumes entered correctly?	/		
3. Were yields entered correctly?	/		
4. Were spectra reviewed/meet contractual requirements?			/
5. Were raw counts reviewed for anomalies?	/		
E. Other 1. Are all Nonconformances included and noted?			/
2. Are all required forms filled out?	/		
3. Was the correct methodology used?	/		
4. Was transcription checked?	/		
5. Were all calculations checked at a minimum frequency?	/		
6. Are worksheet entries complete and correct?			

Comments on any "No" response:

First Level Review: Pam Anderson Date: 1-17-03

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SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 3010350

Review Item	Yes (√)	No (√)	N/A (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: _____

Second Level Review: Barbara McGillyn Date: 1/17/03

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
First Level Review

1 P

Lot Number: J3A090301
Client ID: BHI
Due Date: 1/30/03
QC Batch Number: 20/0356
Method Test Parameter: S3-04
Matrix: Solid
SDG Number: ~~N/A~~ WO 3944

Review Item	Yes (√)	No (√)	N/A (√)
A. COC 1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓		
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?			✓
C. QC & Samples 1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓		
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data 1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?			✓
4. Were spectra reviewed/meet contractual requirements?			✓
5. Were raw counts reviewed for anomalies?	✓		
E. Other 1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response:

First Level Review: Pam Anderson Date: 1-14-03

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 3010356

Review Item	Yes (√)	No (√)	N/A (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?			

Comments on any "No" response: _____

Second Level Review: Barbara McDonough Date: 1/15/03

SEVERN TRENT STL

W03944

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J3A090301
Client ID: BHI
Due Date: 1/30/03
QC Batch Number: 3010354
Method Test Parameter: S4-NBCS
Matrix: Soil
SDG Number: W3944

Review Item	Yes (√)	No (√)	N/A (√)
A. COC 1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓		
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?	✓		
C. QC & Samples 1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓		
3. Are the MS/MSD results, yields and MDAs within contract limits?	✓		
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data 1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?	✓		
4. Were spectra reviewed/meet contractual requirements?			✓
5. Were raw counts reviewed for anomalies?	✓		
E. Other 1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response: ______________________________

First Level Review: Pam Anderson Date: 1-20-03

LS-038A, Rev. 9, 8/02

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 3010354

Review Item	Yes (√)	No (√)	N/A (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: _____

Second Level Review: [signature] Date: 1-23-03

SEVERN TRENT SERVICES

Richland Laboratory
Data Review Check List
METALS

Work Order Number(s): WO 3944

Lab Sample Numbers or SDG: FFVM1e Batch # 3010358

Method/Test/Parameter: Hexavalent Chromium RICMX 5005 Rev

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration				
1. Performed at required frequency with required number of levels?	X			✓
2. Correlation coefficient within QC limits?	X			✓
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	X			✓
4. Initial calibration blank(ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	X			✓
B. Continuing Calibration				
1. CCV analyzed at required frequency and all parameters within QC limits?	X			✓
2. CCB analyzed at required frequency and all results ≤ reporting limit?	X			✓
C. Sample Analysis				
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?		X		✓
2. Were all sample holding times met?	X			✓
D. QC Samples				
1. All results for the preparation blank below limits?	X			✓
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?	X			✓
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?	X			✓
4. Analytical spikes within QC limits where applicable?	X			✓
5. ICP only: One serial dilution performed per SDG?			X	✓
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			X	✓
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			X	✓

CJ 1-22-03

33

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
E. Other				
1. Are all nonconformances included and noted?			X	✓
2. Is the correct date and time of analysis shown?	X			✓
3. Did the analyst sign and date the front page of the analytical run?	X			✓
4. Correct methodology used?	X			✓
5. Transcriptions checked?	X			✓
6. Calculations checked at minimum frequency?	X			✓
7. Units checked?	X			✓

Comments on any "No" response:

Analyst: _____ Date: 1-22-03

Second-Level Review: _____ Date: 1-24-03

Form No. CG-191, Rev. 3, 12/01

CHAIN OF CUSTODY

Q-01030

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-030-086	Page 1 of 1
Collector: Nielson/Stankovich	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 8L
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-1		SAF No.: B00-030	Air Quality ☐
Ice Chest No.: ERC-97-094	Field Logbook No.: EL-1535-8	COA: R116F12600	Method of Shipment: ~~FedEx~~ GOV. VEHICLE	
Shipped To: Severn Trent Incorporated, Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A	

Data Turnaround: 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive

Special Handling and/or Storage

SDG W03944

SAMPLE ANALYSIS: Due 1-30 J3A090301

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	Strontium-89,90 -- Total Sr; Nickel-63; Carbon-14	Activity Scan
				None	aG	1	60mL		Cool 4C	None	None	None
~~J00FK9~~	~~SOIL~~	1-7-3										
J00FL0 FFVM6	SOIL	1-8-3	0845	✓	—	—	—	—	—	—	—	—

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MTR STANKOVICH	1-8-3 1430	3B/3728	1-8-3 1430
3B/3728	1-9-03 1200	K Nielson/R Nielson	1-9-03 1200
K Nielson/R Nielson	1-9-03 1400	Courier/A. Rhineheart	1-9-03 14:00

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Chromium, Lead}; Mercury - 7471 - (CV)
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Personnel not available to relinquish samples from the 3728 Ref # JB on 1/9/03

Matrix *: S=Soil; SE=Sediment; SO=Solid; SI=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

ERC Radiological Counting Facility Analysis Report

RCF Number RCF9825 **Sample Date & Time** 11/6/01 1225

Project ID: 116-F-1 **SAF Number:** B00-029 **Date Analyzed** 11/12/01 8:04:

Sample ID: B13DV9

Gamma Energy Analysis

Nuclide		Activity (pCi/g)		Error (pCi/g)	MDC (pCi/g)
Co-60		1.3E+00	+/-	1.6E-01	8.3E-02
Cs-137		1.0E+01	+/-	7.4E-01	8.8E-02
Eu-152		1.7E+01	+/-	9.4E-01	3.3E-01
Eu-154		2.1E+00	+/-	2.9E-01	2.3E-01
Eu-155	<	2.8E-01			2.8E-01
Am-241	<	1.7E-01			1.7E-01

TPH4 TOP

Total GEA (pCi/g)	3.0E+01	+/-	2.1E+00

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	N/R	+/-	N/R
Gross Beta	N/R	+/-	N/R

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDA = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDA GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

Analyst _____ 11/13/01
C. W. Landes

Report To	Fax
Mike Stankovich	521-8001
Joan Kessner	372-9487

Report Printed: Tuesday, November 13, 2001

SEVERN TRENT SERVICES

Sample Check-in List

Date/Time Received: 1/9/03 @ 14:00 AR

Client: BHT SDG #: W039444 NA [ ] SAF #: B00-030 NA [ ]

Work Order Number: J3A090301 Chain of Custody # B00-030-086

Shipping Container ID: ERC-97-094 Air Bill # N/A

1. Custody Seals on shipping container intact? NA [ ] Yes [X] No [ ]
2. Custody Seals dated and signed? NA [ ] Yes [X] No [ ]
3. Chain of Custody record present? Yes [X] No [ ]
4. Cooler temperature: 4°C NA [ ] 5. Vermiculite/packing materials is NA [ ] Wet [ ] Dry [X]
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? NA [X] Yes [ ] No [ ]
8. Samples have:
   - [X] tape
   - [X] custody seals
   - [X] hazard labels
   - [X] appropriate samples labels
9. Samples are:
   - [X] in good condition
   - [ ] broken
   - [ ] leaking
   - [ ] have air bubbles

   (Only for samples requiring head space)
10. Sample pH taken? NA [X] pH<2 [ ] pH>2 [ ]
11. Sample Location, Sample Collector Listed? * Yes [X] No [ ]
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [X]
13. Description of anomalies (include sample numbers): _____

Sample Custodian: [signature] / Richland Date: 1/9/03

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____

LS-023, 9/01, Rev. 4

SEVERN TRENT SERVICES

*** RE-COUNT REQUEST ***

DUE DATE 1-30-02

CUSTOMER BHI

ANALYSIS Gamma

MATRIX Soil

LOT NUMBER J3A090301

SAMPLE DELIVERY GROUP WO 3944

OLD BATCH NUMBER 3010352

	LAB SAMPLE ID	REASON FOR REQUEST & ANALYSIS COMMENTS
1)	FFVM6-1-AF	Dup of 001
2)	FFVM6-1-AJ-X	Recount Dup on different detector
3)		1-27-03
4)		
5)		
6)		
7)		
8)		
9)		
10)		
11)		
12)		
13)		
14)		
15)		
16)		
17)		
18)		
19)		
20)		

1/27/03 1:14:23 PM

Sample Preparation/Analysis

Balance Id:

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
5I CLIENT: HANFORD

Pipet #: _____

Report Due: 01/30/2003

Sep1 DT/Tm Tech:

Batch: 3010352 **SOIL** **pCi/g** **PM, Quote: BG2, 27038**

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date
1 FFVM6-1-AF J3A090301-1-SAMP										
01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4			Scr Rst:	Alpha: 9.99E+01 pCi/g		Beta: 2.82E+01 pCi/g	
2 FFVM6-1-AJ-X J3A090301-1-DUP										
01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4			Scr Rst:	Alpha: 9.99E+01 pCi/g		Beta: 2.82E+01 pCi/g	
3 FFVM6-2-AF J3A090301-1-SAMP	317-6 g				S200		600	68	1751	1/28/03
01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4			Scr Rst:	Alpha: 9.99E+01 pCi/g		Beta: 2.82E+01 pCi/g	
4 FFVM6-2-AJ-X J3A090301-1-DUP	317-6				S200		600	G7	1/29 0409	1/28/2003
01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4			Scr Rst:	Alpha: 9.99E+01 pCi/g		Beta: 2.82E+01 pCi/g	
5 FFXHW-1-AA-BX J3A100000-352-MBLK										
01/08/2003 08:45		AmtRec:	#Containers: 1			Scr Rst:	Alpha:		Beta:	
6 FFXHW-1-AC-CM J3A100000-352-MLCS										
01/08/2003 08:45		AmtRec:	#Containers: 1			Scr Rst:	Alpha:		Beta:	

Recount Dup on different detector 1/29/03

Sample Preparation/Analysis

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
5I CLIENT: HANFORD

Balance Id:
Pipet #: _____
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Report Due: 01/30/2003

Batch: 3010352 pCi/g

SEQ Batch, Test: None

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date

Comments:

All Clients for Batch:
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc. , BG2, 27038

FFVM61AF-SAMP Constituent List:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:20	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20
Cs-137DA	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20	Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20
Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20	Eu-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20

FFXHW1AA-MBLK:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:20	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20
Cs-137DA	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20	Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20
Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20	Eu-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:20

FFXHW1AC-MLCS:

Cs-137	RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35	Cs-137DA	RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35
K-40	RDL:--	pCi/g	LCL:70	UCL:130	RPD:35	Ra-226	RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35
RA-228	RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35	RA-228DA	RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35
U-238	RDL:	pCi/g	LCL:70	UCL:130	RPD:35						

FFVM61AF-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXHW1AA-MBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXHW1AC-MLCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

ICOC Fraction Transfer/Status Report

ByDate: 12/30/02, 1/30/03, Batch: '3010352', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3010352						
AC		**CalcC**	**BELSITOB**	1/10/03 3:28:17 PM		
SC			WagarR	IsBatched	1/10/03 1:54:45 PM	ICOC_RADCALC v4.5.3.2
SC			BELSITOB	InPrep	1/10/03 3:28:17 PM	RICH-RC-5013 REVISION 4
SC			BELSITOB	InPrep	1/10/03 3:28:21 PM	RICH-RC-5017 REVISION 3
SC			BELSITOB	Prep1C	1/13/03 10:50:31 AM	RICH-RC-5013 REVISION 4
SC			BELSITOB	Prep1C	1/13/03 10:50:35 AM	RICH-RC-5017 REVISION 3
SC			BlackCL	InCnt1	1/13/03 10:53:22 AM	RICH-RD-0007 REVISION 3
SC			DAWKINSO	CalcC	1/19/03 3:07:48 PM	RICH-RD-0007 REVISION 3
SC			BlackCL	InCnt1	1/27/03 1:45:12 PM	RICH-RD-0007 REVISION 3
SC			BlackCL	CalcC	1/29/03 10:06:10 AM	RICH-RD-0007 REVISION 3
AC			**BELSITOB**	1/10/03 3:28:21 PM		
AC			**BELSITOB**	1/13/03 10:50:31 AM		
AC			**BELSITOB**	1/13/03 10:50:35 AM		
AC			**BlackCL**	1/13/03 10:53:22 AM		
AC			**DAWKINSO**	1/19/03 3:07:48 PM		
AC			**BlackCL**	1/27/03 1:45:12 PM		
AC			**BlackCL**	1/29/03 10:06:10 AM		

AC: Accepting Entry; SC: Status Change

1/10/2003 1:54:50 PM

Sample Preparation/Analysis

Balance Id: PB3001-5

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
5I CLIENT: HANFORD

PRIORITY

Pipet #: N14

Report Due: 01/30/2003 W03944

Sep1 DT/Tm Tech:

Batch: 3010352 SOIL pCi/g

PM, Quote: BG2, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: RB

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date
1 FFVM6-1-AF J3A090301-1-SAMP	317.6					S200	600	G5	1/17 0249	1/16/2003 DD
01/08/2003 08:45	AmtRec: LP,2X60G,20ML	#Containers: 4	Scr Rst:	Alpha: 9.99E+01 pCi/g	Beta: 2.82E+01 pCi/g					
2 FFVM6-1-AJ-X J3A090301-1-DUP	317.6							G6	1723	1/18/03 S
01/08/2003 08:45	AmtRec: LP,2X60G,20ML	#Containers: 4	Scr Rst:	Alpha: 9.99E+01 pCi/g	Beta: 2.82E+01 pCi/g					
3 FFXHW-1-AA-BX J3A100000-352-MBLK	348.0	OSBK						G2	1/17 0246	1/16/2003 DD
01/08/2003 08:45	AmtRec:	#Containers: 1	Scr Rst:	Alpha:	Beta:					
4 FFXHW-1-AC-CM J3A100000-352-MLCS	200.01	CAL491						G7	1/17 1723	1/18/03 S
~~01/08/2003 08:45~~ 1/1/03	AmtRec:	#Containers: 1	Scr Rst:	Alpha:	Beta:					

MS 1/13/03

Comments: Recount dup on different detector. RB 1/13/03

All Clients for Batch:
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc. , BG2, 27038

FFVM61AF-SAMP Constituent List:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:						

FFXHW1AA-MBLK:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:						

FFXHW1AC-MLCS:

Sample Preparation/Analysis

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
5I CLIENT: HANFORD

PRIORITY

Balance Id:
Pipet #: _____

Report Due: 01/30/2003

Sep1 DT/Tm Tech:

Batch: 3010352 pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date
Cs-137 RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35	K-40	RDL:--	pCi/g	LCL:70	UCL:130	RPD:35
Ra-226 RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35	RA-228	RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35
RA-228DA RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35	U-238	RDL:	pCi/g	LCL:70	UCL:130	RPD:35

FFVM61AF-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXHW1AA-MBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXHW1AC-MLCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

1/27/03 1:15:27 PM

ICOC Fraction Transfer/Status Report

ByDate: 12/28/02, 1/28/03, Batch: '3010352', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3010352						
AC		CalcC	**BELSITOB**	1/10/03 3:28:17 PM		
SC			WagarR	IsBatched	1/10/03 1:54:45 PM	ICOC_RADCALC v4.5.3.2
SC			BELSITOB	InPrep	1/10/03 3:28:17 PM	RICH-RC-5013 REVISION 4
SC			BELSITOB	InPrep	1/10/03 3:28:21 PM	RICH-RC-5017 REVISION 3
SC			BELSITOB	Prep1C	1/13/03 10:50:31 AM	RICH-RC-5013 REVISION 4
SC			BELSITOB	Prep1C	1/13/03 10:50:35 AM	RICH-RC-5017 REVISION 3
SC			BlackCL	InCnt1	1/13/03 10:53:22 AM	RICH-RD-0007 REVISION 3
SC			DAWKINSO	CalcC	1/19/03 3:07:48 PM	RICH-RD-0007 REVISION 3
AC			**BELSITOB**	1/10/03 3:28:21 PM		
AC			**BELSITOB**	1/13/03 10:50:31 AM		
AC			**BELSITOB**	1/13/03 10:50:35 AM		
AC			**BlackCL**	1/13/03 10:53:22 AM		
AC			**DAWKINSO**	1/19/03 3:07:48 PM		

AC: Accepting Entry; SC: Status Change

STL.Richland

Richland Wa.

Grp Rec Cnt: 6

ICOCFractions

1/13/03 12:53:37 PM

Sample Preparation/Analysis

Balance Id:1120373922 #02, #04

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

CH Sr-Total PrpRC5013, SepRC5006
TH Total Strontium by GPC
5I CLIENT: HANFORD

PRIORITY

Pipet #: NA

Report Due: 01/30/2003 W03944

Sep1 DT/Tm Tech: 1/16/03 11:50 AM

Batch: 3010350 SOIL pCi/g

PM, Quote: BG2, 27038

Sep2 DT/Tm Tech: NA

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry (mg)	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date
1 FFVM6-1-AC J3A090301-1-SAMP		6.02g,in	SRTA8552 12/06/02 09/19/02,r			75.9	50	31A	2020	1/16/2002OP
01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4					Scr Rst:	Alpha: 9.99E+01 pCi/g	Beta: 2.82E+01 pCi/g
2 FFVM6-1-AH-X J3A090301-1-DUP		6.01g,in	SRTA8553 12/06/02 09/19/02,r			76.6		31B	2020	1/16/2002OP
01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4					Scr Rst:	Alpha: 9.99E+01 pCi/g	Beta: 2.82E+01 pCi/g
3 FFXGH-1-AA-B J3A100000-350-BLK		6.0g,in	SRTA8554 12/06/02 09/19/02,r			86.1		31C	2020	1/16/2002OP
01/08/2003 08:45		AmtRec:	#Containers: 1					Scr Rst:	Alpha:	Beta:
4 FFXGH-1-AC-C J3A100000-350-LCS		6.0g,in	STSB0652 10/03/02 09/19/02,r			83.6		31D	2020	1/16/2002OP
01/08/2003 08:45		AmtRec:	#Containers: 1					Scr Rst:	Alpha:	Beta:

Comments:

All Clients for Batch:
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc. , BG2, 27038

FFVM61AC-SAMP Constituent List:

Sr-90	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35

FFXGH1AA-BLK:

Sr-90	RDL:1	pCi/g	LCL:	UCL:	RPD:

FFXGH1AC-LCS:

Sr-90	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35

FFVM61AC-SAMP Calc Info:

1/17/03 2:29:04 PM

ICOC Fraction Transfer/Status Report

ByDate: 12/18/02, 1/18/03, Batch: '3010350', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3010350						
AC		CalcC	**BELSITOB**	1/10/03 3:28:35 PM		
SC			WagarR	IsBatched	1/10/03 1:54:45 PM	ICOC_RADCALC v4.5.3.2
SC			BELSITOB	InPrep	1/10/03 3:28:35 PM	RICH-RC-5013 REVISION 4
SC			BELSITOB	Prep1C	1/13/03 10:50:47 AM	RICH-RC-5013 REVISION 4
SC			WAGNERJ	InPrep2	1/13/03 12:50:56 PM	RICH-RC-5013 REVISION 4
SC			WAGNERJ	Prep2C	1/14/03 9:10:33 AM	RICH-RC-5013 REVISION 4
SC			FABREM	InSep1	1/14/03 2:22:10 PM	RICH-RC-5006 REVISION 4
SC			FABREM	Sep1C	1/16/03 3:20:56 PM	RICH-RC-5006 REVISION 4
SC			DAWKINSO	InCnt1	1/16/03 4:23:01 PM	RICH-RD-0003 REVISION 3
SC			BlackCL	InCnt1	1/17/03 8:46:42 AM	RICH-RD-0003 REVISION 3
SC			BlackCL	CalcC	1/17/03 8:51:00 AM	RICH-RD-0003 REVISION 3
AC			**BELSITOB**	1/13/03 10:50:47 AM		
AC			**WAGNERJ**	1/13/03 12:50:56 PM		
AC			**WAGNERJ**	1/14/03 9:10:33 AM		
AC			**FABREM**	1/14/03 2:22:10 PM		
AC			**FABREM**	1/16/03 3:20:56 PM		
AC			**DAWKINSO**	1/16/03 4:23:01 PM		
AC			**BlackCL**	1/17/03 8:46:42 AM		
AC			**BlackCL**	1/17/03 8:51:00 AM		

AC: Accepting Entry; SC: Status Change

1/10/2003 1:54:51 PM

Sample Preparation/Analysis

Balance Id: 029

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

5S C-14 Prp/SepRC5022
S3 Carbon-14 by Liquid Scint
5I CLIENT: HANFORD

PRIORITY

Pipet #: _____

Report Due: 01/30/2003 W03944

Sep1 DT/Tm Tech: 1-13-03 dm

Batch: 3010356 SOIL pCi/g

PM, Quote: BG2, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date
1 FFVM6-1-AG J3A090301-1-SAMP 01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4		Scr Rst:	Alpha: 9.99E+01 pCi/g	Beta: 2.82E+01 pCi/g	
2 FFVM6-1-AM-X J3A090301-1-DUP 01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4		Scr Rst:	Alpha: 9.99E+01 pCi/g	Beta: 2.82E+01 pCi/g	
3 FFXH7-1-AA-B J3A100000-356-BLK 01/08/2003 08:45		AmtRec:	#Containers: 1		Scr Rst:	Alpha:	Beta:	
4 FFXH7-1-AC-C J3A100000-356-LCS 01/08/2003 08:45		AmtRec:	#Containers: 1		Scr Rst:	Alpha:	Beta:	
5 FFXH7-1-AD-BN J3A100000-356-IBLK 01/08/2003 08:45		AmtRec:	#Containers: 1		Scr Rst:	Alpha:	Beta:	
6 FFXH7-1-AE-BN J3A100000-356-IBLK 01/08/2003 08:45		AmtRec:	#Containers: 1		Scr Rst:	Alpha:	Beta:	

Sample Preparation/Analysis

5S C-14 Prp/SepRC5022
S3 Carbon-14 by Liquid Scint
5I CLIENT: HANFORD

PRIORITY

Balance Id: 029
Pipet #: _____
Sep1 DT/Tm Tech: 1-13-03 am
Sep2 DT/Tm Tech:
Prep Tech:

Report Due: 01/30/2003

Batch: 3010356 pCi/g

SEQ Batch, Test: None

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date

Comments:

All Clients for Batch:
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc. , BG2, 27038

FFVM61AG-SAMP Constituent List:
C-14 RDL:50 pCi/g LCL:70 UCL:130 RPD:35
FFXH71AA-BLK:
C-14 RDL:50 pCi/g LCL: UCL: RPD:
FFXH71AC-LCS:
C-14 RDL:50 pCi/g LCL:70 UCL:130 RPD:35
FFXH71AD-IBLK:
C-14 RDL:50 pCi/g LCL: UCL: RPD:
FFXH71AE-IBLK:
C-14 RDL:50 pCi/g LCL: UCL: RPD:

FFVM61AG-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXH71AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXH71AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXH71AD-IBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXH71AE-IBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

1/15/03 8:50:33 AM

ICOC Fraction Transfer/Status Report

ByDate: 12/16/02, 1/16/03, Batch: '3010356', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q	Batch	Work Ord	CurStatus	Accepting		Comments
3010356						
AC			**CalcC**	**BELSITOB**	1/10/03 3:28:40 PM	
SC				WagarR IsBatched	1/10/03 1:54:45 PM	ICOC_RADCALC v4.5.3.2
SC				BELSITOB InPrep	1/10/03 3:28:40 PM	RICH-RC-5013 REVISION 4
SC				BELSITOB Prep1C	1/10/03 3:28:51 PM	RICH-RC-5013 REVISION 4
SC				McDowellD InSep1	1/13/03 11:14:32 AM	RICH-RC-5022 REVISION 3
SC				McDowellD Sep1C	1/13/03 2:39:00 PM	RICH-RC-5022 REVISION 3
SC				DAWKINSO InCnt1	1/13/03 2:53:42 PM	RICH-RD-0001 REVISION 2
SC				BlackCL CalcC	1/14/03 9:54:42 AM	RICH-RD-0001 REVISION 2
AC				**BELSITOB**	1/10/03 3:28:51 PM	
AC				**McDowellD**	1/13/03 11:14:32 AM	
AC				**McDowellD**	1/13/03 2:39:00 PM	
AC				**DAWKINSO**	1/13/03 2:53:42 PM	
AC				**BlackCL**	1/14/03 9:54:42 AM	

50

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

Grp Rec Cnt: 6

ICOCFractions

1/13/03 1:13:46 PM

Sample Preparation/Analysis

PRIORITY

Balance Id:1120373922 / A1354-S

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

AF Ni-63 PrpRC5013/5019, SepRC5069
S4 Nickel by ICP and Nickel-63 by Liquid Scint
5I CLIENT: HANFORD

Pipet #: MA

Report Due: 01/30/2003 W03944

Batch: 3010354 SOIL pCi/g

PM, Quote: BG2, 27038

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

(5)

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date
1 FFVM6-1-AD J3A090301-1-SAMP			0.2514g,in	0.251g	NITA1165 12/17/02		100			
01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4				Scr Rst:	Alpha: 9.99E+01 pCi/g	Beta: 2.82E+01 pCi/g	
2 FFVM6-1-AK-S J3A090301-1-MS			0.2513g,in	0.251g	NISA0453 12/17/02					
01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4				Scr Rst:	Alpha: 9.99E+01 pCi/g	Beta: 2.82E+01 pCi/g	
3 FFVM6-1-AL-X J3A090301-1-DUP			0.2513g,in	0.251g	NITA1166 12/17/02					
01/08/2003 08:45		AmtRec: LP,2X60G,20ML	#Containers: 4				Scr Rst:	Alpha: 9.99E+01 pCi/g	Beta: 2.82E+01 pCi/g	
4 FFXH3-1-AA-B J3A100000-354-BLK			0.25g,in	0.25g	NITA1167 12/17/02					
01/08/2003 08:45		AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:	
5 FFXH3-1-AC-C J3A100000-354-LCS			0.25g,in	0.25g	NISA0454 12/17/02					
01/08/2003 08:45		AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:	
6 FFXH3-1-AD-BN J3A100000-354-IBLK										
01/08/2003 08:45		AmtRec:	#Containers: 1				Scr Rst:	Alpha:	Beta:	

Sample Preparation/Analysis

AF Ni-63 PrpRC5013/5019, SepRC5069
S4 Nickel by ICP and Nickel-63 by Liquid Scint
5I CLIENT: HANFORD

PRIORITY

Balance Id:
Pipet #: _____
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Report Due: 01/30/2003

Batch: 3010354 pCi/g

SEQ Batch, Test: None

Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date

Comments:

All Clients for Batch:
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc. , BG2, 27038

FFVM61AD-SAMP Constituent List:
Ni-63 RDL:30 pCi/g LCL:70 UCL:130 RPD:35
FFVM61AK-MS Constituent List:
Ni-63 RDL:30 pCi/g LCL:70 UCL:130 RPD:35
FFXH31AA-BLK:
Ni-63 RDL:30 pCi/g LCL: UCL: RPD:
FFXH31AC-LCS:
Ni-63 RDL:30 pCi/g LCL:70 UCL:130 RPD:35
FFXH31AD-IBLK:
Ni-63 RDL:30 pCi/g LCL: UCL: RPD:

FFVM61AD-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFVM61AK-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXH31AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXH31AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXH31AD-IBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

1/20/03 5:12:29 PM

ICOC Fraction Transfer/Status Report

ByDate: 12/21/02, 1/21/03, Batch: '3010354', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3010354						
AC		**CalcC**	**ManisD**	1/6/03 3:46:58 PM		
SC			ManisD	InSep1	1/6/03 3:46:58 PM	RICH-RC-5069 REVISION 4
SC			WagarR	IsBatched	1/10/03 1:54:45 PM	ICOC_RADCALC v4.5.3.2
SC			BELSITOB	InPrep	1/10/03 3:28:30 PM	RICH-RC-5013 REVISION 4
SC			BELSITOB	Prep1C	1/13/03 10:50:42 AM	RICH-RC-5013 REVISION 4
SC			WAGNERJ	InPrep2	1/13/03 12:50:52 PM	RICH-RC-5013 REVISION 4
SC			WAGNERJ	Prep2C	1/14/03 11:15:12 AM	RICH-RC-5013 REVISION 4
SC			ManisD	Sep1C	1/15/03 3:47:18 PM	RICH-RC-5069 REVISION 4
SC			DAWKINSO	InCnt1	1/16/03 1:45:56 PM	RICH-RD-0001 REVISION 2
SC			BlackCL	CalcC	1/20/03 12:50:52 PM	RICH-RD-0001 REVISION 2
AC			**BELSITOB**	1/10/03 3:28:30 PM		
AC			**BELSITOB**	1/13/03 10:50:42 AM		
AC			**WAGNERJ**	1/13/03 12:50:52 PM		
AC			**WAGNERJ**	1/14/03 11:15:12 AM		
AC			**ManisD**	1/15/03 3:47:18 PM		
AC			**DAWKINSO**	1/16/03 1:45:56 PM		
AC			**BlackCL**	1/20/03 12:50:52 PM		

AC: Accepting Entry; SC: Status Change

1/10/2003 1:54:52 PM

Sample Preparation/Analysis

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

PRIORITY

Balance Id:

Pipet #: _____

Report Due: 01/30/2003 WO3944

Sep1 DT/Tm Tech:

Batch: 3010358 **SOIL** **mg/kg**

PM, Quote: BG2, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date
1 FFVM6-1-AA										
J3A090301-1-SAMP										
01/08/2003 08:45		AmtRec: LP,2X60G,20ML		#Containers: 4		Scr Rst:	Alpha: 9.99E+01 pCi/g		Beta: 2.82E+01 pCi/g	
2 FFVM6-1-AN-S										
J3A090301-1-MS										
01/08/2003 08:45		AmtRec: LP,2X60G,20ML		#Containers: 4		Scr Rst:	Alpha: 9.99E+01 pCi/g		Beta: 2.82E+01 pCi/g	
3 FFVM6-1-AP-X										
J3A090301-1-DUP										
01/08/2003 08:45		AmtRec: LP,2X60G,20ML		#Containers: 4		Scr Rst:	Alpha: 9.99E+01 pCi/g		Beta: 2.82E+01 pCi/g	
4 FFVM6-1-AQ-S										
J3A090301-1-MS										
01/08/2003 08:45		AmtRec: LP,2X60G,20ML		#Containers: 4		Scr Rst:	Alpha: 9.99E+01 pCi/g		Beta: 2.82E+01 pCi/g	
5 FFXJH-1-AA-B										
J3A100000-358-BLK										
01/08/2003 08:45		AmtRec:		#Containers: 1		Scr Rst:	Alpha:		Beta:	
6 FFXJH-1-AC-C										
J3A100000-358-LCS										
01/08/2003 08:45		AmtRec:		#Containers: 1		Scr Rst:	Alpha:		Beta:	

Sample Preparation/Analysis

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

PRIORITY

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Report Due: 01/30/2003

Batch: 3010358 mg/kg

SEQ Batch, Test: None

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date

Comments:

All Clients for Batch:
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc. , BG2, 27038

FFVM61AA-SAMP Constituent List:

FFVM61AN-MS Constituent List:

FFVM61AQ-MS:

FFXJH1AA-BLK:

FFXJH1AC-LCS:

FFVM61AA-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFVM61AN-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFVM61AQ-MS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXJH1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
FFXJH1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

SEVERN TRENT STL

ANALYTICAL REPORT

PROJECT NO. 100H AREA FULL

B00-030

Lot #: F3A100179
SDG # WO 39144

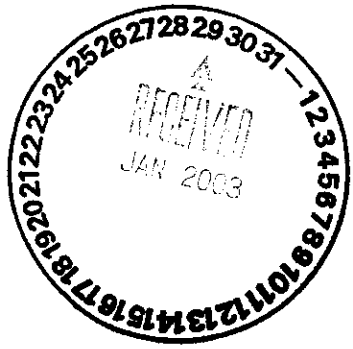
Joan Kessner

Bechtel Hanford, Inc.
3190 George Washington Way
Richland, WA 99352

SEVERN TRENT LABORATORIES, INC.

MWard

MARTI WARD
Project Manager



January 27, 2003

SEVERN TRENT STL

CASE NARRATIVE

Bechtel Hanford Incorporated
3190 George Washington Way
Richland, Washington 99352
January 27, 2003

Attention: Joan Kessner

Project Number	:	40232
SAF	:	B00-030
SDG	:	W03944
Number of Samples	:	one
Sample Matrix	:	Soil
Data Deliverable	:	Summary
Date SDG Closed	:	January 9, 2003

II. Introduction

On January 10, 2003, one (1) "soil" sample was received by STL--St. Louis for chemical analysis. The sample was received at the St. Louis lab at ambient temperature. Review the COC and CUR forms for variations in sample condition or temperature upon arrival at the lab. See the attached Sample Summary form for the Lab ID's and corresponding Client Ids.

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits. This report is incomplete without the Case Narrative. Results are reported "as received"; i.e. wet weight, unless otherwise noted on the data sheets.

Analyses requested: see attached Method Summary Sheet

Deviation from Request: metals run by 6010B instead of 6010A

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike
MS- Matrix Spike.
DUP- Matrix Duplicate
MSD- Matrix Spike Duplicate.

SEVERN TRENT STL

V. Comments

General: The term "Detection Limit" used in the analytical data reports refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

Please refer to the attached cross-reference table for the standard preparation methods used at Quanterra, St. Louis.

Metals: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

The sample was received with the sample from W03941. Due to a FED EX shipping delay both samples were received on the same day and logged into the same lot. QC was done on the sample from W03941 (J00FK9). Because they were both in the same batch, QC was not done on J00FL0. A copy of the MS/MSD report for J00FK9 is included in this report. All QC met criteria.

I certify that this Summary is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Marti Ward

Marti Ward
St. Louis Project Manager

SAMPLE SUMMARY

F3A100179

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
FFWJX	001	J00FK9	01/07/03	09:00
FFWKN	002	J00FL0	01/08/03	08:45

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

METHODS SUMMARY

F3A100179

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Mercury in Solid Waste (Manual Cold-Vapor)	SW846 7471A	SW846 7471A
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3050B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

LOT# F3A100179

STL ST. LOUIS

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-030-086	Page 1 of 1
Collector: Nielson/Stankovich	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-1		SAF No.: B00-030	Air Quality: ☐
Ice Chest No.: ERC-96-087	Field Logbook No.: EL-1535-8	COA: R116F12600	Method of Shipment: FedEx	
Shipped To: Severn Trent Incorporated, ~~Richland~~ ST LOUIS	Offsite Property No.: A030 099		Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive

Tie To B13 DV9

Special Handling and/or Storage

W03941

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None	Cool 4C	None	None	None
				Type of Container	aG	aG	P	aG	P
				No. of Container(s)	1	1	1	1	1
				Volume	60mL	60mL	1000mL	60mL	2[illegible]mL
					See item (1) in Special Instructions	Chromium Hex - 7196	See item (2) in Special Instructions	Strontium-89,90 -- Total Sr, Nickel-63, Carbon-14	Activity Scan
J00FK9	SOIL	1-7-3	0900		–	–	–	–	
~~J00FL0~~	~~SOIL~~	1-7-3							

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MC Mstankovich	1-7-3 1430	3B/3728	1-7-3 1430
3B 3728	1-9-3 1000	R. Fahl R. Fahl	1-9-3 1000
R Fahl R. Fahl	1-9-3 1000	Fed Ex	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Chromium, Lead}; Mercury - 7471 - (CV)
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Personnel not available to relinquish samples from the 3728 Ref # 3B on 1/9/03

Matrix *: S=Soil; SE=Sediment; SO=Solid; SI=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION — Received By: [illegible] — Title: — Date/Time: 1-10-03 0900

FINAL SAMPLE DISPOSITION — Disposal Method: — Disposed By: — Date/Time:

BHI-EE-011 (03/01/2002)

LOT# F3A100179

STL ST. LOUIS

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-030-086	Page 1 of 1
Collector: Nielson/Stankovich	Company Contact: Mike Stankovich; Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-1	SAF No.: B00-030	Air Quality ☐
Ice Chest No.: FRC-96-087	Field Logbook No.: EL-1535-8; COA: R116F12600	Method of Shipment: FedEx	
Shipped To: Severn Trent Incorporated, ~~Richland~~ ST LOUIS	Offsite Property No.: A030 099	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive

Special Handling and/or Storage

W03941

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation: None	Cool 4C	None	None	None	Type of Container: aG	aG	P	aG	P	No. of Container(s): 1	1	1	1	1	Volume: 60mL	60mL	1000mL	60mL	20mL
				See item (1) in Special Instructions	Chromium Hex - 7196	See item (2) in Special Instructions	Strontium-89,90 - Total Sr; Nickel-63; Carbon-14	Activity Scan															
~~J00FK9~~	~~SOIL~~	NO 1-7-3																					
J00FL0	SOIL	1-6-3	0845	✓	✓	✓	✓	✓															

CHAIN OF POSSESSION	Sign/Print Names		
	Relinquished By/Removed From	Date/Time	Received By/Stored In / Date/Time
1	ALT STANKOVICH 1-8-3	1430	36/3728 1-8-3 1430
2	REF 3B 19-03	10 30	SJ GALE 1903 1030
3	SJ GALE 1903	1030	FED EX
4			
5			
6			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Chromium, Lead}; Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Personnel not available to relinquish samples from the 3728 Ref # 3B on 1/9/03

Matrix *: S=Soil; SE=Sediment; SO=Solid; SI=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
	Doris Akers		1-10-03 0900
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

ERC Radiological Counting Facility Analysis Report

RCF Number RCF9825 **Sample Date & Time** 11/6/01 1225

Project ID: 116-F-1 **SAF Number:** B00-029 **Date Analyzed** 11/12/01 8:04:

Sample ID: B13DV9

Gamma Energy Analysis

Nuclide		Activity (pCi/g)		Error (pCi/g)	MDC (pCi/g)
Co-60		1.3E+00	+/-	1.6E-01	8.3E-02
Cs-137		1.0E+01	+/-	7.4E-01	8.8E-02
Eu-152		1.7E+01	+/-	9.4E-01	3.3E-01
Eu-154		2.1E+00	+/-	2.9E-01	2.3E-01
Eu-155	<	2.8E-01			2.8E-01
Am-241	<	1.7E-01			1.7E-01

116F1

Total GEA (pCi/g)	3.0E+01	+/-	2.1E+00

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	N/R	+/-	N/R
Gross Beta	N/R	+/-	N/R

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDA = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDA GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dss is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dss is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorption
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

Analyst C. W. Landon 11/13/01

Report To	Fax
Mike Stankovich	521-9001
Joan Kessner	372-0487

Report Printed: Tuesday, November 13, 2001

LOT# F3A100179

STL ST. LOUIS

SEVERN TRENT SERVICES

Lot No.: F3A100179
W03941

Condition Upon Receipt Form
St. Louis Laboratory

Client: Bechtel Hanford
Quote No: 40232
Shipper/No: 792804453160

Date: 10-03 Time: 0900
Initiated by: KA
COC/RFA Numbers: B00-030-086

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1.	(Y) N	Sample received in undamaged condition.	5.	(Y) N	Sample volume sufficient for analysis.
2.	Y (N)	Sample received within 4°C ± 2°C*. Record temperature: Ambient	6.	(Y) N	Sample received with Chain of Custody.
			7.	(Y) N	Chain of Custody matches sample IDs on containers.
3.	Y N (N/A)	Sample received with proper pH**.	8.	(Y) N	Custody seal received intact and tamper evident on cooler.
4.	(Y) N	Sample received in proper containers.	9.	(Y) N	Custody seal received intact and tamper evident on bottles.

*** Temperature Variance Does Not Affect the Following Analyses:** _____

**** For DOE-AL (Pantex, LANL, Sandia, Timet) sites, remember to pH all containers received, except for VOA, TOX, and soils.**

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: Kris Albers Date: 1-10-03

Project Management Review: Michael Date: 1-10-03

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM

LOT# F3A100179

METALS

BECHTEL HANFORD, INC.

Client Sample ID: J00FL0

TOTAL Metals

Lot-Sample #...: F3A100179-002 Matrix.....: SOLID
Date Sampled...: 01/08/03 Date Received..: 01/09/03
% Moisture.....: 13

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 3013160						
Mercury	0.035 B	0.038	mg/kg	SW846 7471A	01/13/03	FFWKN1AA
		Dilution Factor: 1		MDL.....: 0.0090		
Prep Batch #...: 3014119						
Arsenic	6.3	1.2	mg/kg	SW846 6010B	01/14-01/15/03	FFWKN1AD
		Dilution Factor: 1		MDL.....: 0.11		
Chromium	25.3	1.2	mg/kg	SW846 6010B	01/14-01/15/03	FFWKN1AC
		Dilution Factor: 1		MDL.....: 0.13		
Lead	5.9 J	0.58	mg/kg	SW846 6010B	01/14-01/15/03	FFWKN1AE
		Dilution Factor: 1		MDL.....: 0.077		

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F3A100179 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F3A130000-160 **Prep Batch #...:** 3013160						
Mercury	ND	0.033	mg/kg	SW846 7471A	01/13/03	FF0391AA
		Dilution Factor: 1				
MB Lot-Sample #: F3A140000-119 **Prep Batch #...:** 3014119						
Arsenic	ND	1.0	mg/kg	SW846 6010B	01/14-01/15/03	FF2A51AC
		Dilution Factor: 1				
Chromium	ND	1.0	mg/kg	SW846 6010B	01/14-01/15/03	FF2A51AA
		Dilution Factor: 1				
Lead	**0.11 B**	**0.50**	**mg/kg**	**SW846 6010B**	**01/14-01/15/03**	**FF2A51AD**
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F3A100179 **Matrix.....:** SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F3A130000-160 **Prep Batch #...:** 3013160							
Mercury	9.41	8.33	mg/kg	89	SW846 7471A	01/13/03	FF0391AC
			Dilution Factor: 10				
LCS Lot-Sample#: F3A140000-119 **Prep Batch #...:** 3014119							
Chromium	82.6	87.4	mg/kg	106	SW846 6010B	01/14-01/15/03	FF2A51AF
			Dilution Factor: 1				
Arsenic	197	211	mg/kg	107	SW846 6010B	01/14-01/15/03	FF2A51AG
			Dilution Factor: 1				
Lead	95.0	99.7	mg/kg	105	SW846 6010B	01/14-01/15/03	FF2A51AH
			Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F3A100179 **Matrix.....:** SOLID
Date Sampled...: 01/07/03 **Date Received..:** 01/09/03

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F3A100179-001 **Prep Batch #...:** 3013160									
								% Moisture.....: 5.0	
Mercury									
	0.015	0.175	0.193	mg/kg	101		SW846 7471A	01/13/03	FFWJX1AH
	0.015	0.175	0.193	mg/kg	101	0.0	SW846 7471A	01/13/03	FFWJX1AJ
			Dilution Factor: 1						
MS Lot-Sample #: F3A100179-001 **Prep Batch #...:** 3014119									
								% Moisture.....: 5.0	
Arsenic									
	3.3	210	211	mg/kg	99		SW846 6010B	01/14-01/15/03	FFWJX1AM
	3.3	210	204	mg/kg	95	3.4	SW846 6010B	01/14-01/15/03	FFWJX1AN
			Dilution Factor: 1						
Chromium									
	10.8	21.0	33.8	mg/kg	110		SW846 6010B	01/14-01/15/03	FFWJX1AK
	10.8	21.0	28.2	mg/kg	83	18	SW846 6010B	01/14-01/15/03	FFWJX1AL
			Dilution Factor: 1						
Lead									
	8.5	52.6	59.0	mg/kg	96		SW846 6010B	01/14-01/15/03	FFWJX1AP
	8.5	52.6	56.1	mg/kg	91	5.0	SW846 6010B	01/14-01/15/03	FFWJX1AQ
			Dilution Factor: 1						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

Sample J00FK9 from SDG W03941. Batch QC.

MW
1.27.03